

# Sunshine-powered: The next agrarian revolution

by [Norman Wirzba](#) in the [May 19, 2009](#) issue

Today's transcontinental head of lettuce, grown in California but eaten in Washington, D.C., is emblematic of our dysfunctional food economy. For every calorie of food energy this lettuce provides, roughly 35 calories of fossil fuel energy will have been burned to grow, harvest, process and ship it. Compare this to 60 years ago when one calorie of fossil fuel produced roughly two and a half calories of food. From the standpoints of energy efficiency and cost-effectiveness, we would be better off drinking the oil.

Fossil fuel circulates throughout and saturates our current food systems, making it appropriate to rename the 20th century's Green Revolution as the Black Revolution. Cheap oil has determined the shape and scale of our food economies at every level, encouraging lengthy (and thus also vulnerable) supply lines, megagrocery stores and highly processed, overpackaged foods. Cheap fossil fuel has created widespread dependence on costly farm inputs like fertilizers, pesticides and farm machinery. It has also made possible the growth of cities, like Louisville, Kentucky, Indianapolis and Columbus, Ohio, that are in the heart of prime agricultural lands, yet still import food from places around the nation and the globe. Meanwhile the land, the water and the rural communities that directly surround these urban centers are in serious decline. If oil taps were suddenly to be shut off, most of us—farmers included—would starve.

We must wean ourselves off fossil fuel. Nobody knows exactly how long it will be before cheap oil is only a memory. We do know, however, that we can't afford the greenhouse gases that our oil- and gas-driven food economy emits every year (the food economy is responsible for as much as 37 percent of total emissions). We can't afford the loss of soils and soil fertility (worldwide an area roughly the size of Nebraska is lost to urban sprawl, soil erosion and desertification each year) or the encroachment on forests and wetlands. We can't afford the cardiovascular disease and Type II diabetes that are the direct result of consuming fatty, highly processed and artificially sweetened food products. We need the insights and skills of

agricultural communities that grow food in locally adapted, healthy, humane and sustainable ways.

To replace the fossil fuel food economy, we need a sunshine food economy. A sunshine economy represents a unique revolution in human consciousness and practice. In contrast to civilization's previous revolutions—the agricultural, iron, industrial, green and now global revolutions—the sunshine revolution restores rather than burns up carbon. Each of the previous revolutionary advances depended on the exploitation of previously untapped forms of carbon—they used the soil, burned forests, consumed coal or burned oil and natural gas. A sunshine economy would cultivate diverse forests and return green cover to the bulk of the earth's landscapes. Keeping carbon in the ground rather than burning it up is a vital step in the effort to halt, if not reverse, the worst effects of climate change.

Over the past several months a number of this nation's leading agrarians, including Wes Jackson, Wendell Berry, David Orr, Herman Daly and Fred Kirschenmann, have been meeting to work out the conceptual and practical details necessary to move beyond today's fossil fuel addictions. They are devising a 50-Year Land Use Bill that will nurture soil fertility, conserve forests and watersheds, rebuild rural communities and bring food production into harmonious alignment with ecological systems.

Intended as legislation, this bill would supplant the dismal farm bills adopted by Congress every five years that keep the nation mired in policies that exhaust and degrade waters, lands and bodies and that prevent good forestry and agricultural practices. Sunshine-powered, natural-systems agriculture must replace many of the current agriculture policies and practices if we hope to eat healthy food in the long term in a world of growing populations and declining habitats. It will not be enough simply to tweak today's food economy and expect healthy, sustainable food production.

To begin, Wendell Berry has offered the following land-management goals:

- 1) Promote a diversity of locally adapted domestic species of crops and animals and increase the acreage of perennials.
- 2) Conserve land and water and properly use woodlands and wetlands.
- 3) Install proper fences, fencerows, permanent pastures, farm woodlots, boundaries and edges, all of which would increase and diversify

populations of wild species.

- 4) Put more farmers, foresters and other workers in the land economy.
- 5) Develop local facilities for the processing, distributing and marketing of local products.
- 6) Return to propriety of scale; not least, we must scale down our confidence in our own intelligence.

The distinguishing marks of a sunshine economy are its commitment to local habitats and the ecology of individual locations, the development of self-reliance, fair trade among communities (trade that honors rather than exploits local skills, resources and traditions), personal and communal restraint, and full-cost accounting.

The proposed 50-Year Land Use Bill will not require a massive infusion of new money from the government. To get it going, money that is now being paid out through the farm bill will go to the development of natural-systems agriculture and toward the infrastructure—microprocessing facilities and regional distribution networks—necessary for a local food economy. Today's subsidy payments, many of which end up in the hands of oil companies, banks, machine companies, and commodities giants like Monsanto, Cargill and Archer Daniels Midland, need to be diverted to support farmers who want to take land out of annual, monoculture crop production and put it into pasture, crop rotation, vegetable production, animal husbandry or the growing of perennial grains in polycultures (today's farm bill discourages farmers from growing "specialty crops" like fruits and vegetables). The resources currently applied to the farm bill should be reapplied to support a more comprehensive land-use bill that will ensure the health of the nation's agricultural fields, ranchlands, forests and waterways, and that will promote smaller-scale, locally adapted food, fiber and timber production.

The 50-Year Land Use Bill will essentially reverse the ratio of land devoted to perennials as compared to annuals. Perennials are at the heart of the sunshine food economy. Today 80 percent of cropland is devoted to annual monoculture production (corn, soybeans, wheat) and only 20 percent is used for perennials (tree and vine crops, hay and forage). This bill proposes that after 50 years, 80 percent of cropland will be devoted to trees, vines, hay, forage and perennial grains (like those being developed at the Land Institute in Kansas). Annual crops like vegetables will

be grown in rotation and on land that is the least susceptible to erosion. Above all else, soil fertility must be protected and nurtured because it is indispensable for the growth of a sunshine economy.

Long-term success depends on having fields and forests that effectively and cleanly harness the sun's energy for us. Perennials do this best because they capture the sun's energy without the disruption of soil and a heavy reliance on fossil fuel-derived fertilizers. Because of their deep roots and symbiotic plant relationships, perennials grown in polycultures stabilize soil, build soil fertility, manage soil nutrients and retain water.

As cropland across the nation is converted to perennials, the livestock currently housed in Confined Animal Feeding Operations will be set free. CAFOs would not have been possible without the cheap commodities produced by annual, monoculture farming. Once released to pasture, ruminants like cattle will again be able to eat grass rather than grain and improve the soil's fertility with a steady application of their own manure. They will not need the steroids and antibiotics currently used to speed up fattening and to keep them alive until they are large enough to be sent to slaughter. Feeding on grass, they will produce meat that is much leaner and healthier for humans to eat.

Finally, we need to revitalize rural economies. Today's agricultural communities are in serious decline. Once vibrant towns with stores, schools and restaurants, many are now virtually ghost towns, while slums and trailer parks are springing up all over the countryside to house a migrant workforce that is mostly underpaid and rarely appreciated. The economic policies of the last decades have resulted in the creation of massive farms that destroy land and community alike. It is time to reverse those policies so that more people—somewhere between 50 and 80 million will be needed—can return to the land and develop smaller, more diverse farm operations and revitalize rural towns.

Sunshine-powered farms will necessarily be more labor intensive. But this labor will honor the land, animals and workers alike. In a time when the knowledge needed to farm well is fast disappearing with the death of the older generation of farmers, we need to invest in educational and redevelopment programs that will give young people the tools and the support they need to build a new agriculture based on ecological principles and community needs. Not everyone should farm. But for those who desire to, the current economic roadblocks should be removed. Tending and keeping the land is physical but also spiritual work. Many people who are now

underemployed or unemployed might find such work immensely valuable and satisfying.

Critics will claim that what is being proposed here is too expensive and risky, and that organically grown food costs too much and can't be grown in yields high enough to feed a growing world population. To answer these charges we must start by acknowledging that today's supposedly cheap food is dishonestly priced. The price hides the many costs of land and animal abuse and human injustice and ill health. One way to think about a sunshine economy is to see it as our most ambitious and honest attempt to account for the cost of the food system. We have lived as bandits who steal from the ground and from future generations. We have assumed that we can endlessly draw down the earth's fertility without returning nutrients to the soil. We have assumed that resources are infinite stockpiles meant exclusively for us. We have grown naive—some would say criminal—in the belief that what we do today does not have implications and costs for generations to come. Some body is going to have to pay for ruined soils, contaminated waters, wasted forests, the loss of biodiversity and the destruction of food networks and infrastructure.

Food grown sustainably does cost more, but it also creates numerous health, ecological and economic benefits. Adjustments in social and government priorities can make sure that all people can afford good food and clean water. The same principle applies to volume. It is foolish to maintain current yields of crops that depend on practices that are unsustainable. Fields that grow a diversity of foods are more productive than those devoted to monoculture growing (and more efficient than fields that feed CAFOs that then feed us).

Implementing the 50-Year Land Use Bill will not come easily or without serious resistance. The lobbies for fossil fuel and industrial agriculture are extremely powerful. Change will come when citizens and food consumers demand a food economy that is healthy and sustainable.

A sunshine economy based on natural systems using sunlight to grow the goods we need will require skills that industrial agriculture shuns as obsolete: attention, patience and fidelity; commitment to a region; affection for one's fields and animals and the resolve to fix mistakes. Ecclesiastes suggests that there is hope for those "who are joined with all the living" (9:4). Today's fossil fuel food economy disappoints such hope. It compromises the sources of life and blocks a deep appreciation for the land. A sunshine economy offers a comprehensive vision and a plan that can inspire hope and promote the health of land and people together.

---

See [7 things you can do right now to further the sunshine economy](#), compiled by Amy Fryknolm.